

PATENT APPLN. NO. 10/600,571  
RESPONSE UNDER 37 C.F.R. §1.111

PATENT  
NON-FINAL

REMARKS

*Claim Rejections - 35 USC § 103*

Claims 17-19, 21-25, and 29 re rejected under 35 U.S.C. §103(a) as being unpatentable over Katoh et al., U.S. Patent No. 5,402,641 ("Katoh") in view of Ozawa et al., U.S. Patent No. 5,075,276 ("Ozawa").

Initially, it is noted that claim 17 has been amended to change the recitation "an exhaust gas purifying-use catalyst" to -- an exhaust gas purifying catalyst--. This amendment is based on the description on page 15, second paragraph, through page 16, first paragraph, of the specification. This amendment has been made to ensure that the catalyst used in the method of the present invention is interpreted as one which can directly purify an exhaust gas.

Referring to the 35 U.S.C. § 103(a) rejection, applicants note that on page 4 of the Action the Office states:

"Katoh et al. disclose the claimed invention except for applying the invention to a gasoline fuel-direct-injection type engine. It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the invention of Katoh et al. to a gasoline fuel-direct-injection type engine, since

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the recitation of such amounts to an intended use statement."

(Action, page 4, lines 4-7, emphasis added).

The underlined statement is wrong. Claim 17 recites the steps, inter alia, of "providing [a] gasoline engine of the fuel-direct-injection type" and "directly injecting gasoline into a cylinder of the gasoline engine of a fuel-direct-injection type." The use of a gasoline engine of the fuel-direct-injection type is a positive limitation that must be given weight by the Office.

The Office cannot base its conclusion of obviousness of applying the invention of Katoh to a gasoline fuel-direct-injection type engine on the position that the use of a gasoline engine of the fuel-direct-injection type is an intended use limitation and must remove this position as a basis for rejection.

Katoh also does not disclose, explicitly or inherently, the steps of the method recited in claim 17.

The invention of the present application as recited in claim 17 and the claims dependent thereon and the invention of Katoh are utterly different in (i) temperature of an exhaust gas and (ii) means for purifying the exhaust gas. The invention of Katoh does not disclose or suggest anything about the method claimed in the present application.

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That is, the invention of Katoh is an apparatus for absorbing  $\text{NO}_x$  included in an exhaust gas having excess oxygen therein and releasing the  $\text{NO}_x$  when an oxygen concentration of the exhaust gas decreases. The exhaust gas temperature is in the range of 550°C-750°C and the  $\text{NO}_x$  absorbent temperature is in a range of 500°C-700°C (see, for example, claim 15).

In contrast, the invention of the method of the present application is characterized in that the temperature of an exhaust gas is controlled before the exhaust gas is purified. The first exhaust gas recited in the claim 17 of the present application has an exhaust-gas temperature in a range of 350°C-800°C, and an air-fuel ratio of 13 to 15. The second exhaust gas recited in claim 17 of the present application has an exhaust-gas temperature in a range of 250°C-350°C, and an air-fuel ratio of more than 15. In the invention as recited in claim 17 of the present application, an exhaust gas purifying catalyst which can purify both the first and second exhaust gas is used as the means for purifying an exhaust gas.

In the invention of Katoh, the exhaust gas temperature is in a range of 550°C-750°C. In contrast, in the method of the invention of the present application, an exhaust gas can be purified at a temperature of not more than 350°C which is outside

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the range of temperature disclosed in the invention of Katoh. I.e., the present invention adopts an exhaust gas condition different from that of Katoh et al.

Applicants note that the Office in the Action on page 3, lines 15-17; alleges that Katoh discloses:

"combusting the mixture to form an exhaust gas in a second exhaust gas state (lean air-fuel ratios) having an exhaust-gas temperature being in a range of 200°C to 500°C at the inlet to the catalyst (step 106 with NO answer and step 110); and contacting the exhaust gas in the second exhaust gas state with the catalyst to remove hydrocarbons, carbon monoxide and nitrogen oxides from the second exhaust gas and purify the second exhaust gas (see at least Figure 3A and lines 15-23 of column 4)".

This allegation is totally unsupported. Nowhere does Katoh disclose forming an exhaust gas in a second exhaust gas state having an exhaust-gas temperature in a range of 200°C to 500°C and then contacting the exhaust gas in the second exhaust gas state with the catalyst to purify the second exhaust gas. The cited disclosures of Katoh do not support the allegation (e.g., no step including forming an exhaust gas having a temperature in the range

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200°C to 500°C is disclosed) and the Office has not provided proper evidence of reasoning to support the specifics of the allegation.

Therefore, the invention of the present application, which is characterized in that (i) an exhaust gas is purified at a temperature range which is not disclosed in Katoh, and (ii) an air-fuel ratio is specified in the temperature range, is not disclosed or suggested in Katoh as described in the Action. Katoh et al. does not disclose or suggest anything about the conditions in the invention of the present application as recited in claim 17, and the claims dependent thereon; and a person of ordinary skill in the art would not have been motivated or otherwise had a reason to modify the method carried out by the apparatus of Katoh so as to reach the invention as recited in the claims.

Ozawa has not been cited as overcoming the above-noted deficiencies and does not, in fact, overcome the insufficiencies of Katoh to support a case of *prima facie* obviousness under 35 U.S.C. § 103(a) of the claims of the present application.

A layered catalyst is used in the invention of Ozawa. A top layer of the layered catalyst includes alumina, titanium oxide and the like; and at least one oxide of a rare earth element other than cerium and lanthanum. A feature of the invention of Ozawa et al.

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lies in that the layered catalyst is used in order to purify an exhaust gas whose A/F ratio is 14.6.

In contrast, a feature of the invention of the amended claims of the present application lies in that the temperature of an exhaust gas is controlled before the exhaust gas is purified. The first exhaust gas recited in claim 17 of the present application has an exhaust-gas temperature in a range of 350°C-800°C, and an air-fuel ratio of 13 to 15. The second exhaust gas recited in claim 17 of the present application has an exhaust-gas temperature in a range of 250°C-350°C, and an air-fuel ratio of more than 15. In the invention of claim 17 of the present application, an exhaust gas purifying catalyst which can purify both the first and second exhaust gas is used as the means for purifying an exhaust gas.

The proposed combination of Katoh and Ozawa will not result in the method of the present invention as recited in claim 17 and the claims dependent thereon.

Moreover, the invention of Katoh and the invention of Ozawa are different from one another as explained above. Therefore, a person skilled in the art would not have been motivated to combine Katoh and Owaza as proposed in the Action.

Removal of the 35 U.S.C. § 103(a) rejection is in order and is respectfully solicited.

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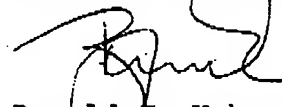
The foregoing is believed to be a complete and proper response to the Office Action dated December 10, 2008.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 111833.

In the event any additional fees are required, please also charge our Deposit Account No. 111833.

Respectfully submitted,

KUBOVCIK & KUBOVCIK



Ronald W. Kubovcik  
Reg. No. 25,401

Crystal Gateway 3  
Suite 1105  
1215 South Clark Street  
Arlington, VA 22202  
Tel: (703) 412-9494  
Fax: (703) 412-9345  
RJK/KTK/esc